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978-1-107-41588-1 - The Respiratory Function of the Blood: Part II: Hæmoglobin

Joseph Barcroft

Frontmatter

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OF THE BLOOD

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# THE RESPIRATORY FUNCTION OF THE BLOOD

PART II  
HÆMOGLOBIN

*by*

JOSEPH BARCROFT  
*Fellow of King's College, Cambridge*

CAMBRIDGE  
AT THE UNIVERSITY PRESS  
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PREFACE  
TO THE FIRST EDITION OF  
THE RESPIRATORY FUNCTION OF THE BLOOD

AT one time, which seems too long ago, most of my leisure was spent in boats. In them I learned what little I know of research, not of technique or of physiology, but of the qualities essential to those who would venture beyond the visible horizon.

The story of my physiological “ventures” will be found in the following pages. Sometimes I have sailed single handed, sometimes I have been one of a crew, sometimes I have sent the ship’s boat on some expedition without me. Any merit which attaches to my narrative lies in the fact that it is in some sense at first hand. I have refrained from discussing subjects which I have not actually touched, but which might fittingly have been included in a modern account of the blood as a vehicle for oxygen. Such are the relation of narcosis to oxygen-want and the properties of intracellular oxidative enzymes. The omission of these and other important subjects has made the choice of a title somewhat difficult. I should like to have called the book, what it frankly is—a log; did not such a title involve an air of flippancy quite out of place in the description of the serious work of a man’s life. I have therefore chosen a less exact, though more comprehensive title.

After all, the pleasantest memories of a cruise are those of the men with whom one has sailed. The debt which I owe to my colleagues, whether older or younger than myself, will be evident enough to any reader of the book. It leaves me well-nigh bankrupt—a condition well known to most sailors. But I owe another large debt of gratitude to those who, as teachers, showed me the fascination of physiology, to Dr Kimmins\*, and especially to

\* Formerly science master of the Leys School, now Chief Inspector of the Educational Department of the London County Council.

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PREFACE

Dr Anderson\*. At a later stage I learned much from Dr Gaskell, Professor Langley and Dr Haldane.

There are occasions on which every sailor of the deep sea has to ship a pilot. Mr A. V. Hill has brought me into those harbours which are best approached through the, to me, unknown channels of mathematics.

\* Formerly supervisor in physiology to King's College, now Master of Gonville and Caius College.

J. B.

CAMBRIDGE,

*December, 1913.*

## PREFACE TO HÆMOGLOBIN

THE rapid advance of knowledge rendered impossible the task of revising *The Respiratory Function of the Blood* for a second edition. The book was in three parts with an Appendix on technique: there is now more than enough known about the subject-matter of each part to justify a book on that alone. I have therefore determined to break up the volume into a *series* of manageable units, originally intended to correspond more or less to the “Parts” of the original work. The first volume of this series, *Lessons from High Altitudes*, appeared in 1925, the second is now presented.

The present volume deals with hæmoglobin regarded as a chemical substance; and here I would like particularly to point to the limited scope of this book. It makes no profession of dealing with the red blood corpuscle, or with the properties of blood. These will form the subject of another volume. Thus the consideration of many now classical investigations, such as those of the Rockefeller Institute and the nomogram of Prof. L. J. Henderson, is reserved for the present.

I have to thank the Royal Society for permission to reproduce Figs. 2, 6, 7, 14, 28, 33, 40, 41, 42, 43, 44, 45, 46 A and B; the Chemical Society for Figs. 15 and 16; the American Chemical Society for Fig. 17; the Editors of *The Journal of Biological Chemistry* for Figs. 34 and 38 and *The Journal of Physiology* for Figs. 8, 9, 10, 29, 30 and 59. For allowing me to reproduce their figures and for much help at various stages my thanks are due to Dr H. Hartridge, Dr D. Keilin, Dr F. J. W. Roughton, Mr G. S. Adair and Mr R. Hill: indeed if the work has any merit it will be largely due to their efforts. For assistance with the proofs and the bibliography I am much indebted to Mrs Thacker, late Fellow of Newnham College and to Miss N. Henderson.

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My debt would not be discharged without one more reference. The expense of much of the later phases of the work done on hæmoglobin in this country has been borne by the Medical Research Council—a department of the Privy Council. How that body came to act “in loco parentis” is worth placing on record. Readers of the book will find that the late Sir William Bayliss was sceptical about the interpretation of much that had been written on hæmoglobin; on the initiative of Prof. A. V. Hill an invitation was sent to him to come to Cambridge and sift the points at issue so far as that could be done by discussion. Many points seemed capable of experimental proof or disproof and Bayliss conceived the idea of interesting the Department of Scientific and Industrial Research in hæmoglobin. The subject fell rather within the sphere of the Medical Research Council who took the matter up and have assisted hæmoglobin research both with funds, sympathy and advice ever since. In thanking the Committee I feel that I must also thank the secretary, Sir Walter Morley Fletcher.

J. B.

CAMBRIDGE,  
3 April, 1928.



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